Nio display systems

Getting Started Guide

Supported displays:

E-2621, E-3620, MDNG-5121, MDNG-2121, MDNC 3120, MDNC-3121, MDNG-6121

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Preface

FCC compliance information

FCC statement for the display

FCC Class B

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Note: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

Canadian notice

This ISM device complies with Canadian ICES-001.
Cet appareil ISM est conforme à la norme NMB-001 du Canada.

Chinese notice

警告使用者：

此為甲類資訊技術設備，於居住環境中使用時，可能會造成射頻擾動，在此種情況下，使用者會被要求採取某些適當的對策。

FCC statement for the graphic board

FCC Compliance Information (display controller)

Class B:

This Barco Graphics Controller complies with part 15 of the FCC rules. Operation is subject to the following two conditions:

1. This device may not cause harmful interference, and
2. this device must accept any interference received, including interference that may cause undesired operation.

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with manufacturer's instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Re-orient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.

- Consult the dealer or an experienced radio/TV technician for help.

The use of shielded cables for connection of the monitor to the graphics card is required to ensure compliance with FCC regulations. Changes or modifications to this unit not expressly approved by Barco could void the user's authority to operate this equipment.

CE mark notice

Declaration of Conformity in accordance with Article 10 (1) of the CE directive

CE
0120

This product has been designed and manufactured in accordance with the essential requirements of the Directives 89/336/EEC and MDD 93/42/EEC (class II b product), and for this product the procedures of Annex II have been applied to mark the product with the CE label.

Environmental information

Disposal Information

This product consists of devices that may contain mercury, which must be recycled or disposed of in accordance with local, state, or country laws. (Within this system, the backlight lamps in the monitor display contain mercury.)

This equipment has required the extraction and use of natural resources for its production. It may contain hazardous substances for health and environment.

In order to avoid the dissemination of those substances in the environment and to diminish the pressure on natural resources, we encourage you to use the appropriate take-back systems.

Those systems will reuse or recycle most of the materials of your end-of-life equipment in a sound way.

The crossed-out wheeled bin symbol invites you to use those systems.

If you need more information on the collection, reuse and recycling systems, please contact your local or regional waste administrator.

You can also contact us for more information on the environmental performances of our products.

Information for China ROHS compliance

Table of toxic and hazardous substances/elements and their content, as required by China's management methods for controlling pollution by electronic information products

	Toxic or hazardous Substances and Elements					
Part Name	**Pb**	**Hg**	**Cd**	**Cr6+**	**PBB**	**PBDE**
Metal parts	O	O	O	O	O	O
Plastic parts	O	O	O	O	O	O
PCB or PCBA	O	O	O	O	O	O
LCD panel	X	X	O	O	O	O
Power supply/adapter	X	O	O	O	O	O
Power cable	X	O	O	O	O	O
Connectors and cables	O	O	O	O	O	O

O: Indicates that this toxic or hazardous substance contained in all of the homogeneous materials for this part is below the limit requirement in SJ/T11363-2006.

X: Indicates that this toxic or hazardous substance contained in at least one of the homogeneous materials used for this part is above the limit requirement in SJ/T11363-2006

中国大陆 RoHS

根据中国大陆 《电子信息产品污染控制管理办法》(也称为中国大陆 RoHS)，以下部份列出了本产品中可能包含的有毒有害物质或元素的名称和含量。

本表适用的产品

液晶显示器

有毒有害物质或元素

LCD Monitor						
零部件名稱	有毒有害物質或元素					
	铅（Pb）	汞（Hg）	镉（Cd）	六价铬（Cr6+）	多溴联苯（PBB）	多溴二苯醚（PBDE）
金属机构件	O	O	O	O	O	O
塑料机构件	O	O	O	O	O	O
电路板组件 *	O	O	O	O	O	O
液晶面板	X	X	O	O	O	O
电源模块 / 适配器	X	O	O	O	O	O
电源线	X	O	O	O	O	O
外部信号连接线	O	O	O	O	O	O

*：电路板组件包括印刷电路板及其构成的零部件，如电阻、电容、集成电路、连接器等

○：表示该有毒有害物质在该部件所有均质材料中的含量均在 《电子信息产品中有毒有害物质的限量要求标准》规定的限量要求以下

×：表示该有毒有害物质至少在该部件的某一均质材料中的含量超出 《电子信息产品中有毒有害物质的限量要求标准》规定的限量要求；
但是上表中打 “×” 的部件，其含量超出是因为目前业界还没有成熟的可替代的技术

Safety Instructions

General Recommendations

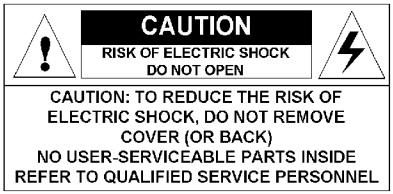
Read the safety and operating instructions before operating the display.

Retain safety and operating instructions for future reference.

Adhere to all warnings on the display and in the operating instructions manual.

Follow all instructions for operation and use.

Electrical shock



Type of protection (electrical):

Display with external power supply: Class I equipment

Degree of safety (flammable anesthetic mixture):

Equipment not suitable for use in the presence of a flammable anesthetic mixture with air or with oxygen or nitrous oxide.

Non-patient care equipment

Equipment primarily for use in a health care facility that is intended for use where contact with a patient is unlikely.

Power connection - E-2621, E-3620, MDNG-5121, MDNG-2121, MDNC 3120 and MDNG-6121

- Power requirements: The display must be powered using the delivered medical approved 12 VDC power supply.

- The medical approved DC power supply must be powered by the AC mains voltage.

Power connection - MDNC-3121

- Power requirements: The display must be powered using the delivered medical approved 24 VDC SELV power supply.
- The medical approved DC power supply must be powered by the AC mains voltage.

Power cords:

- Utilize a UL-listed detachable power cord, 3-wire, type SJ or equivalent, 18 AWG min., rated 300 V min., provided with a hospital-grade type plug 5-15P configuration for 120V application, or 6-15P for 240V application.
- Do not overload wall outlets and extension cords as this may result in fire or electric shock.
- Mains lead protection (U.S.: Power cord): Power cords should be routed so that they are not likely to be walked upon or pinched by items placed upon or against them, paying particular attention to cords at plugs and receptacles.

Water and moisture

Never expose the display to rain or moisture.

Never use the display near water - e.g. near a bathtub, washbasin, swimming pool, kitchen sink, laundry tub or in a wet basement.

Ventilation

Do not cover or block the ventilation openings in the cover of the set. When installing the display in a cupboard or another closed location, heed the necessary space between the set and the sides of the cupboard.

Installation

Place the display on a flat, solid and stable surface that can support the weight of at least 3 displays. If you use an unstable cart or stand,

the display may fall, causing serious injury to a child or adult, and serious damage to the equipment.

More warnings in the Installation chapter.

This apparatus conforms to:

CE0120 (MDD 93/42/EEC class IIb product), IEC 60601-1, UL 60601-1, CAN/CSA C22.2 No. 601.01-M90 (c-UL),
CCC GB4943-1995 (IEC 60950-1).

National Scandinavian Deviations for Cl. 1.7.2 :

Finland: "Laite on liitettävä suojamaadoituskoskettimilla varustettuun pistorasiaan"
Norway: "Apparatet må tilkoples jordet stikkontakt"
Sweden: "Apparaten skall anslutas till jordat uttag"

Recommendations for using your display system

1. Optimize the lifetime of your display

Enabling the Display Power Management System (DPMS) of your display (in the display's Settings menu) will optimize its diagnostic lifetime by automatically switching off the backlight when the display is not used for a specified period of time. By default, DPMS is enabled on your display, but it also needs to be activated on your workstation. To do this, go to "Power Options Properties" in the "Control Panel".

Barco recommends setting DPMS activation after 20 minutes of non-usage.

2. Use a screen saver to avoid image retention

Prolonged operation of an LCD with the same content on the same screen area may result in a form of image retention.

You can avoid or significantly reduce the occurrence of this phenomenon by using a screen saver. You can activate a screen saver in the "Display properties" window of your workstation.

Barco recommends setting screen saver activation after 5 minutes of non-usage. A good screen saver displays moving content.

In case you are working with the same image or an application with static image elements for several hours continuously (so that the screen saver is not activated), change the image content regularly to avoid image retention of the static elements.

3. Understand pixel technology

LCD displays use technology based on pixels. As a normal tolerance in the manufacturing of the LCD, a limited number of these pixels may remain either dark or permanently lit, without affecting the

diagnostic performance of the product. To ensure optimal product quality, Barco applies strict selection criteria for its LCD panels.

To learn more about LCD technology and missing pixels, consult the dedicated white paper available at www.barcomedical.com.

4. Enhance user comfort

Every Barco multi-head display system is color matched with the highest specification in the market.

Barco recommends keeping color-matched displays together. Furthermore, it is important to use all displays of a multi-head configuration at the same rate to preserve color matching throughout the economic lifetime of the system.

5. Maximize Quality Assurance

The 'MediCal QAWeb' system offers online service for high-grade Quality Assurance, providing maximum diagnostic confidence and uptime.

Learn more and sign up for the free MediCal QAWeb Essential level at www.barcomedical.com/qa

Explanation of symbols

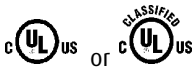
Symbols on the display and / or power supply

On the display or power supply, you may find the following symbols (nonrestrictive list):

Indicates compliance to the essential requirements of the Directive 93/42/EEC

Indicates compliance with Part 15 of the FCC rules (Class A or Class B)

Indicates the display is approved according to the UL regulations



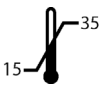
Indicates the display is approved according to the c-UL regulations

Indicates the display is approved according to the DEMKO regulations

Indicates the display is approved according to the CCC regulations

Indicates the USB connectors on the display

Indicates the manufacturing date



Indicates the temperature limitations for the display to operate within specs

Indicates the display serial no.

Consult the operating instructions

Indicates this apparatus must not be thrown in the trash but must be recycled, according to the European WEEE (Waste Electrical and Electronic Equipment) directive

Symbols used throughout the manual:

Warning: Risk of injury to human beings

Caution: Risk of damage to the product

Important notice or remark

Note

Hint, tip

Additional information

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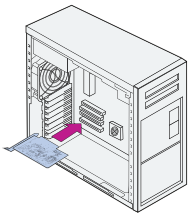
Introduction

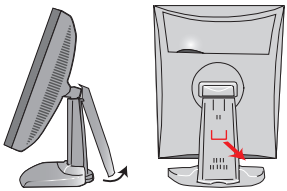
Installation overview

1



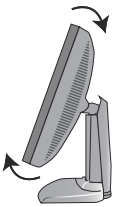
If applicable, install the graphic board in the computer.

2



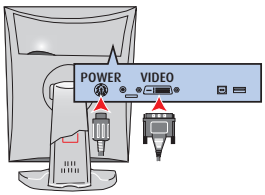
Remove the foot rear cover. Pull out the red clip from the tilt & swivel foot.

3



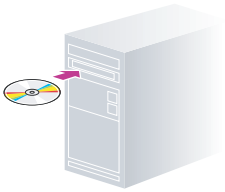
If you wish to rotate the panel, first tilt the panel slightly in order not to damage the tilt & swivel mechanism.

4



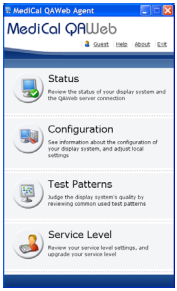
Connect the cables: Video (DVI) and power. Route the cables into the provided clips and guides in the tilt & swivel foot. Close the covers and start up computer and display

5



Install software and user manuals.

6


MediCal QAWeb Agent
MediCal QAWeb
Guest Help About Exit
Status
Review the status of your display system and the QAWeb server connection
Configuration
See information about the configuration of your display system, and adjust local settings
Test Patterns
Judge the display system's quality by reviewing common used test patterns
Service Level
Review your service level settings, and upgrade your service level

Start up and use MediCal QAWeb Agent.

7

Important

Enable DPMS & screensaver for optimal display performance throughout the product lifetime.

Display parts, controls and connectors

Front view

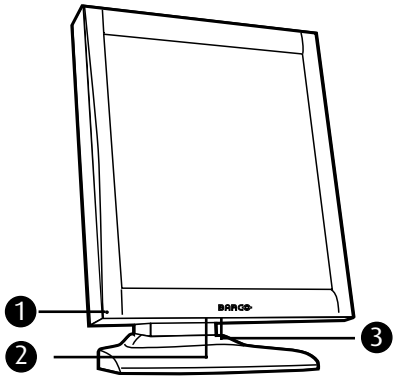


Figure 1: Front side

1. Power LED

   The LED is **off** when the display is disconnected from the power. The LED is also off when the LED function is disabled in the on-screen display (OSD).

   The LED is **green** when the display is on (when enabled in the on-screen menus).

   The LED is **orange** when the display is in Stand-by power-saving mode.

2. USB downstream port. See also item “7.” on page 27

   Note: This connector is not available on MDNC 3120.

3. Control wheel

   The control wheel can be pressed like a push button and rotated like a knob.

It allows to put the display in stand-by, navigate through the on-screen display (OSD) menus and change values in the OSD.

Rear view of E-2621, E-3620, MDNG-5121

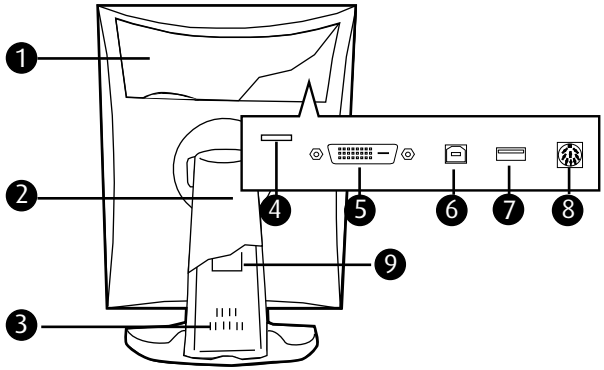


Figure 2: Rear side

1. Connector compartment cover

   To get access to the connectors, remove the cover by pulling down the 2 clips at the top of the cover.

2. Tilt & swivel foot cover

   This cover is packed in a separate box when the display is shipped to the customer.

3. Tilt & swivel foot
4. Slot for security cable (e.g., Kensington lock)
5. DVI (digital) video input
6. USB upstream port

   Connect this connector to the PC USB bus if you wish to connect USB devices to the display's USB downstream port.

7. USB downstream port

When the display is connected to the PC USB bus, you can connect USB devices, such as keyboard, mouse, digital camera, to this connector.

8. DC power input

Connect the external power supply, delivered with the display, to this connector.

9. Tilt & swivel foot clip

The display is shipped with this clip in the foot to protect the tilt & swivel mechanism during transport. After unpacking, you should remove this clip.

Do not throw the clip away! Should the display have to be packed and shipped later, the clip must be applied to the foot again.

Rear view of MDNC 3120, MDNC-3121, MDNG-2121 and MDNG-6121

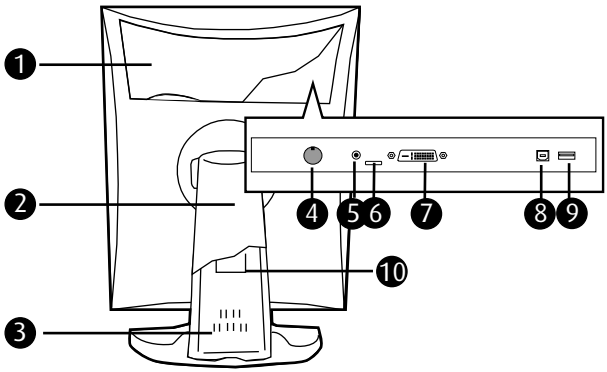


Figure 3: : Rear side

1. Connector compartment cover

To get access to the connectors, remove the cover by pulling down the 2 clips at the top of the cover.

2. Tilt & swivel foot cover

   This cover is packed in a separate box when the display is shipped to the customer.

3. Tilt & swivel foot

4. DC power input

   Connect the external power supply, delivered with the display, to this connector.

5. +5 Vdc, 0.25 A power output for accessories.

6. Slot for security cable (e.g., Kensington lock)

7. DVI (digital) video input

8. USB upstream port

   Connect this connector to the PC USB bus if you wish to connect USB devices to the display's USB downstream port.

9. USB downstream port

   When the display is connected to the PC USB bus, you can connect USB devices, such as keyboard, mouse, digital camera, to this connector.

10. Tilt & swivel foot clip

    The display is shipped with this clip in the foot to protect the tilt & swivel mechanism during transport. After unpacking, you should remove this clip.

    Do not throw the clip away! Should the display have to be packed and shipped later, the clip must be applied to the foot again.

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Display controller installation

Display Controller Installation

Which display controller?

Your Barco medical display is compatible with a large range of Barco and non-Barco display controller boards. Depending on the customer's order details, the display can be delivered with or without display controller.

The brochure "Barco medical display overview" on the website www.barco.com/medical (Downloads section) contains a comprehensive overview of the compatibility matrix of Barco displays and Barco display controllers.

If you are using Barco display controllers, please follow the installation instructions in this section. If you are using a non-Barco display controller, please consult the corresponding documentation.

Installing a Barco display controller

This chapter will guide you through the physical installation of a Barco display controller for your display system.

CAUTION – Wear a grounded, protective ESD strap when handling or during installation of the display controller. Electrostatic charges can damage the display controller.

Overview

Prior to installing the display controller(s) for your BARCO NIO Display System in your PC please take a few minutes to familiarize yourself with both the display controller(s) and the PCIe or PCI slots in your computer.

Types of display controllers for Barco Display Systems

The following models of Barco display controllers are available for your display system. Please check which of the following models is delivered with your system, and follow the corresponding installation instructions:

Board Model	VGA Jumper	Compatible PCIe/PCI Slot
Barco MXRT 1150	No	x1*, x8, x16
Barco MXRT 2100	No	x16
Barco MXRT 2150	No	x16
Barco MXRT 5100	No	x16
Barco MXRT 5200	No	x16
Barco MXRT 7100	No	x16
Barco MXRT 7200	No	x16
Barco MXRT 7300	No	x16
BarcoMed Coronis PCIe	Yes	x8*, x16
BarcoMed Coronis PCI	Yes	PCI 32 or PCI 64*
BarcoMed Nio PCIe	Yes	x8*, x16
BarcoMed Nio PCI	Yes	PCI 32 or PCI 64*
BarcoMed 5MP2FH PCIe	Yes	x8*, x16
BarcoMed 5MP2FH PCI	Yes	PCI 32 or PCI 64*

* *Recommended PCI/PCIe slot*

Note: You can use x16 & x8 slots for x1, & x4 boards.

If you are using a display controller with a VGA jumper, you will need to decide if you are going to use its on-board VGA capabilities. If you are, check the setting of the Jumper at J-1 on the display controller (see figure 4). By default, VGA should be enabled, on the top two pins. To disable the on-board VGA capabilities move the jumper so that it is on the middle and bottom pins.

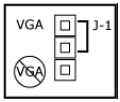


Figure 4: Display controller VGA Jumper, VGA enabled

Note: To use multiple BarcoMed display controllers in a single computer, you need to enable VGA on only ONE of the BarcoMed display controllers and disable VGA on ALL the other BarcoMed display controllers. To use a BarcoMed display controller with a third party VGA controller or with one or more Barco MXRT display controllers, do **NOT** enable VGA on the BarcoMed display controller.

Which PCI/PCIe slot to use

The table on the preceding page lists the different display controller model(s) available for your BARCO NIO Display System and the recommended PCI/PCIe slot to use for optimum performance. Figure 5 shows the different types of PCIe slots that can be used.

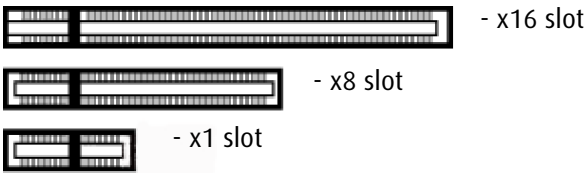


Figure 5: Examples of PCIe slots

Figure 6 shows the two different types of PCI slots that can be used.

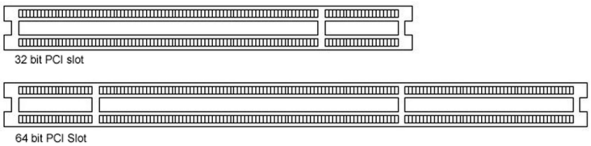


Figure 6: Examples of PCI slots

Installation Procedure

The following instructions will take you step by step through the installation of the display controller(s) for your BARCO NIO Display System.

CAUTION – Wear a grounded, protective ESD strap when handling or during installation of the display controller. Electrostatic charges can damage the display controller.

1. If you are not going to use your old graphics card, uninstall the drivers and software for it if you have not already done so.
2. Turn off the computer, display(s), and other peripheral devices.
3. Unplug the computer's power cord and disconnect all cables from the back of your computer.

Caution – Wait approximately 20 seconds after unplugging the power cord before disconnecting a peripheral or removing a component from the motherboard to avoid possible damage to the motherboard.

4. Remove the computer cover.

   If necessary, consult your computer's manual for help in removing the cover.

5. If necessary, unscrew or unfasten and remove any existing graphics card(s) from your computer.

Note: If you are using a motherboard containing an on-board graphics solution and do not intend to use it as part of a multiple-display setup, disable it either in the computer's System Set-up utility (BIOS) or the Windows device manager.

6. Locate the appropriate slot and, if necessary, remove the metal back-plate cover(s).

7. Align the display controller(s) for your BARCO NIO Display System with the slot(s) and press it(them) in firmly until the card(s) is(are) fully seated.

Note: The next step applies only to the MXRT 5100, MXRT 7100, and MXRT 7200.

8. Connect the power cable(s) to the 6-pin power connection(s) on the graphics card. Make sure the cables are not interfering with anything inside the computer (for example, a cooling fan).

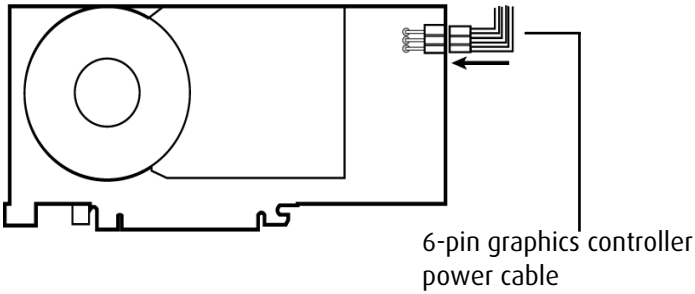


Figure 7: Power connection for the MXRT 5100, 7100, & 7300 controllers

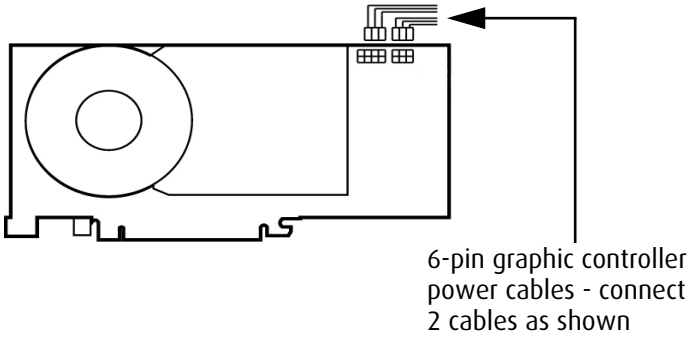


Figure 8: Power connection for the MXRT 7200 controller

9. Screw in or fasten the display controller securely. Replace and secure the computer cover.

10. Connect your BARCO NIO Displays to the display controller(s) for your BARCO NIO Display System using the cables supplied. Make sure all cables are securely connected before turning on your system. Figures 6 - 13 show the types of connections are available:

Connecting your Barco displays

For a detailed description of the display installation and signal connection, please refer to the **"Display installation"** section of this manual.

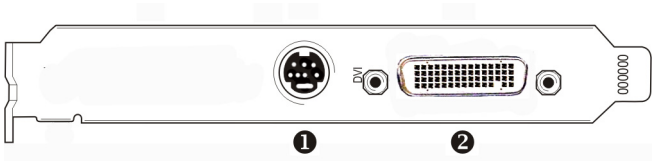


Figure 9:

IO-Panel for the Barco MXRT 1150 and Barco MXRT 2150

❶	S-Video Connection This option is not supported by Barco.
❷	DMS-59 connector provides DVI-I / Head 1 & Head 2 output connections through included Y adaptor cable.

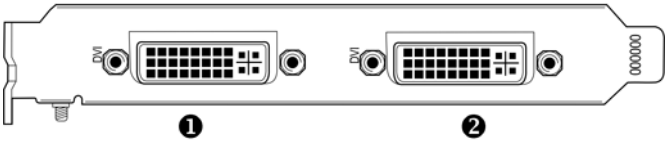


Figure 10:

IO-Panel for the Barco MXRT 2100 and Barco MXRT 5200

	MXRT 2100		MXRT 5200
❶	Head 2– DVI-I Connection	❶	Head 1– DVI-I Connection
❷	Head 1– DVI-I Connection	❷	Head 2– DVI-I Connection

Note: For 6mp, connect Head 1 to left input, and Head 2 to right input.

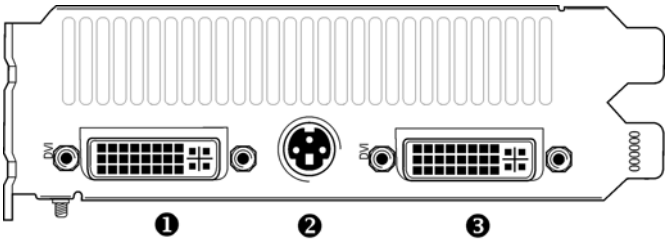


Figure 11:

IO-Panel for the Barco MXRT 5100, Barco MXRT 7100 and Barco MXRT 7200

❶	Head 1 – DVI-I Connection
❷	Stereo Connection This option is not supported by Barco.
❸	Head 2 – DVI-I Connection

Note: For 6mp, connect Head 1 to left input, and Head 2 to right input.

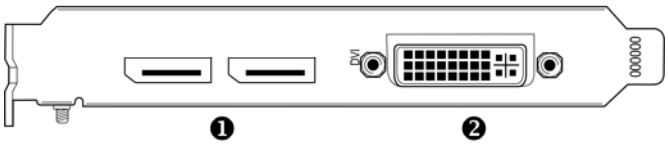


Figure 12:

IO-Panel for the Barco MXRT 7300

❶	DisplayPort Connections
❷	DVI-I Connection

Note: Disconnecting the DisplayPort cable may lock the display.

Note: Only two of the three connectors can be used at a time. Driving three displays is not supported with the MXRT 7300.

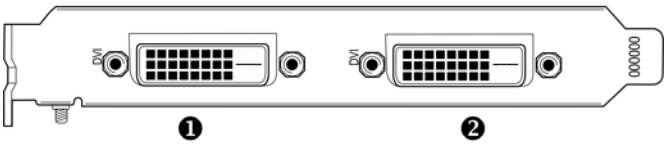


Figure 13:

IO-Panel for the BarcoMed Coronis, BarcoMed Nio, and BarcoMed 5MP2FH family of display controllers

❶	Head 1 – DVI-D Connection
❷	Head 2 – DVI-D Connection

11. Reconnect any cables you have disconnected and plug in the computer's power cord.

12. Turn on the display(s) and then your computer.

Turning on your system

WARNING - Turn on your display(s) before you turn on your computer. Failure to do so could damage your display(s).

If you have properly installed your graphics card, the Windows start-up messages will appear once the boot procedure is finished.

Note: Your Barco display(s) will be running in a basic video mode at a default refresh rate. Higher resolutions and refresh rates, such as 1536x2048@60Hz, are not available at this stage of the installation. Once you have installed the BARCO NIO Display System drivers and software, the Barco monitor Plug and Play software should automatically set the resolution for the displays.

13. Install the drivers, QAWeb software and documentation for your BARCO NIO Display System by following the instructions in the **Driver and Software Installation** section of this manual.

Display installation

Installation precautions

Precautions

- Keep your original packaging. It is designed for this display and is the ideal protection during transport.
- Avoid reflections in the flat panel to reduce eye strain.
- Place the display on a strong and stable table or desk.
- Keep the display away from heat sources and provide enough ventilation around the display.
- Do not use the display in direct sunlight.
- Do not scratch or apply pressure to the screen. This may cause permanent damage.

After unpacking the display

Important

In the factory, the height-positioning system in the display foot is blocked with a red clip to prevent damage during transportation.

Before installing the display, you must remove this clip.

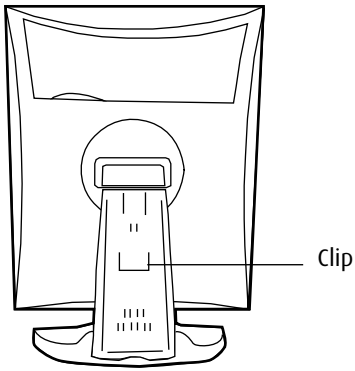


Figure 14

To remove the clip:

1. Position the display with its rear side facing you.
2. Pull the red clip out of the fixation holes in the foot.
3. Keep the clip in case the display needs to be shipped later.

Adjust the panel orientation

You can change the orientation of the panel at any time, but it is more convenient to select landscape or portrait orientation before connecting the cables.

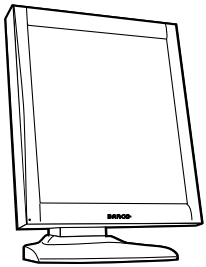


Figure 15: Portrait orientation

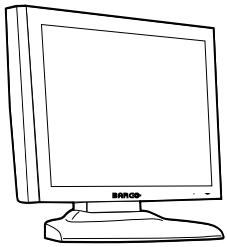


Figure 16: Landscape orientation

To change the panel orientation:

1. Stand at the front side of the panel and take the panel at both sides.
2. Very important: Tilt the panel before changing the orientation.

Should you change the panel orientation without tilting it first, you might irreversibly damage the tilt & swivel mechanism.

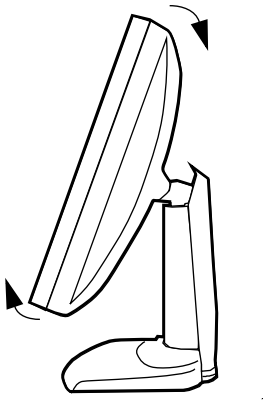


Figure 17: Tilt the panel before rotating

3. To change from portrait to landscape, turn the panel counterclockwise.

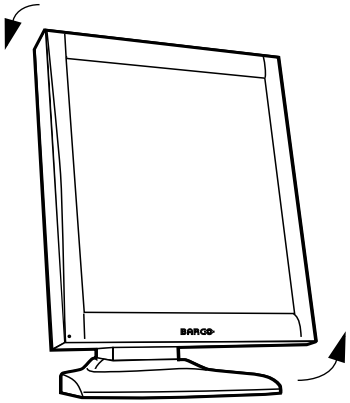


Figure 18: To rotate the panel from portrait to landscape

4. To change from landscape to portrait, turn clockwise.

Note: If, after installing the display or the system, you change the panel orientation while an image is on the screen, the result depends on the graphic board and the resolution of the image. In some cases the image will be rotated automatically, in other cases it will not be rotated (e.g., when pixels would be lost after

rotation). If necessary, change the image resolution in the display control panel and restart the system after changing the orientation.

Connecting the signal cables

To connect the signal cables to the display:

To get access to the connectors, remove the connector compartment cover by pulling down the 2 clips at the top of the cover.

The location of the connectors depends on the display type:

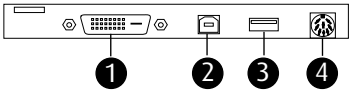


Figure 19: Inputs E-2621, E-3620, MDNG-5121

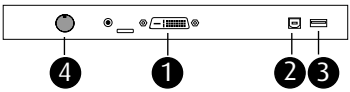


Figure 20: Inputs MDNC 3120, MDNC-3121, MDNG-2121 and MDNG-6121

- Connect one end of the DVI cable to the DVI input of the display (1). Connect the other end of the DVI cable to the DVI connector of the display controller board.
- Connect a PC USB downstream connector to the display's USB upstream connector by means of a USB cable (2).
- Connect any USB device to one of the display's USB downstream connectors (3)
- Connect the DC power input (4) of the display to the external DC power supply. Connect the other end of the external DC power supply to a **grounded** power outlet by means of the proper power cord delivered in the packaging.

Cable routing

Routing the signal cables

- Bind the cables in the connector compartment together with the cable tie inside the connector compartment.
- Put the connector compartment cover back on the display. Pay attention that the signal cables are positioned under the bulge in the cover.
- Push the cables into the clips on the rear of the tilt & swivel foot.
- Bind the cables together above and under the foot, by means of the 2 velcro strips attached to the inside of the foot cover (packed inside the accessory box).
- At last, put the foot cover back in place.

To put the foot cover in place:

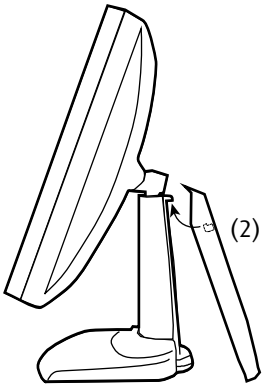


Figure 21:

1. The foot cover is packaged separately in the accessory box. Unpack the foot cover.

2. Push the upper side of the cover onto the foot, so that the hooks inside the cover are positioned right under the bulges at the rear of the foot.
3. Slide the cover upward while moving the lower side of the cover towards the foot.
4. Press the cover to the foot so that it makes a clicking sound.

Vesa-mount installation

The panel, standard attached to the tilt & swivel foot, is compatible with the VESA 100 mm standard. So it can be used with an arm stand according to the VESA 100 mm standard.

Therefore, the tilt & swivel foot must be removed from the panel.

Important

- Use an arm that is approved by VESA (according to the VESA 100 mm standard).
- Use an arm that can support a weight of at least 13 kg (28.66 lbs).

To attach the display to an arm stand:

1. Put the display face down on a clean and soft surface. Be careful not to damage the panel screen.
2. Remove the tilt & swivel foot cover.
3. Remove the small screw (A) fixing the small plastic cover on top of the foot. Next, remove the small cover itself.

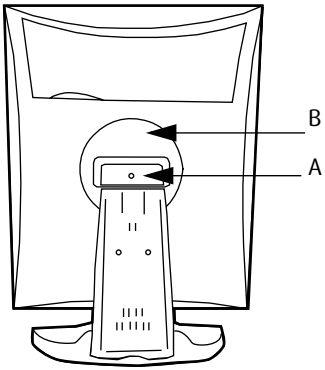
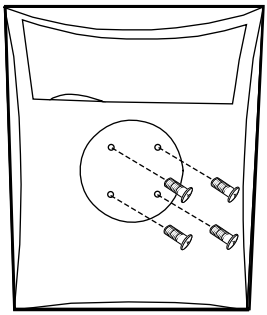


Figure 22: Display with tilt & swivel foot cover removed

4. Unscrew the 2 screws fixing the round plastic cover (B).

5. Lift up the round plastic cover.
6. Remove the four screws fixing the foot while supporting the foot.
7. Attach the arm stand **firmly** to the panel using 4 screws M4 x 8 mm.



4 screws M4 x 8mm

Figure 23

Cleaning instructions

Precautions

- Take care not to damage or scratch the front filter or LCD panel. Be careful with rings or other jewelry that can touch the front filter.
- Do not apply pressure on the front filter or LCD panel.
- Do not apply or spray liquid directly to the front filter, panel or cabinet as excess liquid may cause damage to internal electronics. Instead, apply the liquid to the cleaning cloth.

Front filter

Proceed as follows:

Clean the front filter using a sponge, cleaning cloth or soft tissue, **lightly** moistened with one of the following tested products:

- Flux
- Windex Glass Plus
- Bohle glass cleaner
- Mr. Proper
- Pril
- Ajax glass cleaner
- Sidolin glass cleaner

In case none of the above cleaning products is available, use plain water.

Do NOT use:

- Alcohol/solvents at higher concentration > 5%
- Strong alkalis lye, strong solvents
- Acid
- Detergents with fluoride

- Detergents with ammonia
- Detergents with abrasives
- Steel wool
- Sponge with abrasives
- Steel blades
- Cloth with steel thread

Cabinet

Proceed as follows:

- Clean the cabinet using a soft cotton cloth, lightly moistened with a recognized cleaning product for medical equipment.
- Repeat with water only.
- Wipe dry with a dry cloth.
- The cabinet has been tested for resistance to the following products:
    - Cidex, Betadine
    - Alcohol (Isopropyl and Ethyl)
    - Ammonia-based cleaners (Windex)
    - Aquasonic Gel

Software installation

Driver and Software Installation

This chapter will guide you through the installation of the drivers, software and documentation associated with your BARCO NIO Display System or BARCO NIO Display(s).

The process for the BARCO MXRT family of controllers and BARCOMED family of controllers is handled separately.

If you install Barco displays without Barco display controllers, no drivers will be installed. Only the online user manual will be installed on your system.

Driver and software installation prerequisites

Note: To install or remove the drivers, software, or documentation you must be logged on as a user with administrator privileges.

Your operating system must be installed and running before you can install the driver, software and documentation for the display controller(s) for your BARCO NIO Display System.

Before you begin make sure that all of your BARCO NIO Display(s) are connected to the appropriate display controller(s) in your system.

Note: This installation procedure is based on operating Windows in “Classic” view style. If “Home” or “Default” view style is selected in Windows, sections of this procedure may be different than what is listed.

Installing the BARCO MXRT drivers and software

Note: The installation dialog will display in English if your operating system’s language is not supported.

This process applies to the following versions of Windows:

- Windows XP Professional,

- Windows XP Professional x64 Edition,
- Windows Server 2003,
- Windows Server 2003 x64 Edition,
- Windows Server 2008,
- Windows 2008 x64, and
- Windows Vista 32 & 64 Bit Edition.

You will need to install the BARCO NIO Display system drivers and software in the following cases:

- After you have installed the display controller(s) for your BARCO NIO Display System in your system for the first time.
- After you have reinstalled or upgraded your operating system.
- After you have moved the display controller(s) to a different PCI/PCIe slot.
- When you upgrade to a newer version of the MXRT driver.
- When you put additional MXRT display controllers in your system.

1. You do not need to manually uninstall an existing driver before updating to the current version. The Barco Product Installation Wizard will detect any prior installations and start the uninstallation process automatically.

   Start your system. When the *Found New Hardware Wizard* comes up, click **Cancel**. When the *System Settings Change* window asks you to restart your computer, click **No or Restart Later**.

2. Run the Barco Product Installation Wizard.

   The Barco Product Installation Wizard should start automatically when you insert the BARCO NIO Display System Installation CD-ROM into your computer's CD/DVD drive *after* the operating system has started. If your CD/DVD drive's auto-run is not enabled or the Barco Product Installation Wizard does not start automatically, you can run the Barco Product Installation Wizard manually by following these steps:

   a) Click the **Start** button in the task bar.

b) Click **Run**.

c) Click **Browse** and browse to the root directory of the BARCO NIO Display System Installation CD-ROM and click on the file, **Setup.exe,** and click **Open**.

d) Click **OK**.

or

a) Browse to the root directory of the BARCO NIO Display System Installation CD-ROM and double click on the file, **Setup.exe**.

3. Click **Next twice.**

4. Click **Yes** to accept the terms of the MediCal QAWeb Agent license agreement. The Barco setup wizard will continue with the installation **only** if you accept the terms of the license agreement. If you click **No**, the wizard will exit. Click **Next.**

5. Follow the wizard's on-screen instructions to complete the MediCal QAWeb installation.

6. The Barco Product Installation Wizard will now guide you through the installation of the driver.

7. Click **Yes** to accept the terms of the Barco and ATI license agreements. The Barco setup wizard will continue with the installation **only** if you accept the terms of both license agreements. If you click **No**, the wizard will exit. Click **Next.**

8. Follow the wizard's on-screen instructions to complete the driver installation.

   Note: The driver installation may take up to 5 minutes, and the monitor may blink a few times during the installation process.

   Note: For "non-English" operating systems, you may encounter multiple pop-up screens. If this occurs, click the appropriate buttons to complete the installation.

9. When the driver setup is complete, click the **Finish** button.

10. When the Setup complete message appears, select **Reboot System Now** and click **Finish**.
11. After the system reboots, Windows may display either the *Digital Signature Not Found* message or *The software you are installing for this hardware has not passed Windows logo testing*.

Automated display configuration

Once the drivers, software and documentation have been installed and your system has been rebooted, the *Barco Monitor Plug and Play Software* should automatically detect your Barco displays and attach them to the desktop with the correct resolution. If the *Barco Monitor Plug and Play Software* fails to detect your Barco displays or fails to attach them to the desktop correctly please refer to the section, **Setting the resolution of your Barco Display** in the **Configuring Windows** section of this manual.

Reinstalling drivers

You can install new drivers or reinstall existing drivers at any time by using the Barco Set-up wizard on your BARCO NIO Display System Installation CD-ROM, see **Installing the BARCO MXRT drivers and software**, on page 54 of this manual.

Uninstalling the drivers and software

To uninstall the Barco drivers, software or documentation for your Nio display Systems, please use the *Windows Add/Remove Programs* or *Uninstall* utility. This can be found in the Windows Control Panel. For Vista use *Programs & Features.*

Note: When uninstalling the Barco MXRT drivers, the dialog box shown in figure 24 will appear, and select the driver listed.

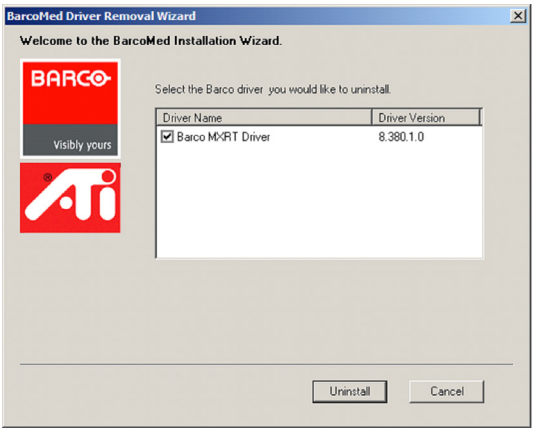


Figure 24: Barco MXRT Driver Removal Wizard (driver version may be different than what is pictured)

Note: *Vista Only:* After uninstalling the driver, shutdown the machine and remove the card. If you leave the card in the system, Vista will automatically reinstall the driver.

If you are uninstalling the Barco MXRT drivers prior to doing a driver upgrade, complete the Barco MXRT Driver Removal Wizard as described, and reboot the system into Safe Mode. From Safe Mode, run the Program Files\Barco\ MXRT_DriverCleaner batch file to remove any remaining files. Then you can reboot into regular Windows mode to install the new driver.

Command line (Silent) Install of Drivers and Software

(Not supported with Windows Vista)

Specifying the silent install option causes most of the GUI associated with the installer to disappear. A background progress window will still be visible, but no user input will be required.

The silent install behavior is dictated by the *SETUP.INI* file. Each application is allowed to have separate command-line parameters for normal and silent installs.

To install the drivers and software silently, please follow the steps below:

1. Insert the BARCO NIO Display System Installation CD-ROM into your CD/DVD drive. When the Barco Product Installation Wizard starts click **"Cancel"**.
2. Click the **Start** button in the task bar.
3. Click **Run**.
4. Click **Browse** and
   a) Browse to the root directory of the BARCO NIO Display System Installation CD-ROM.
   b) Click on the file, **Setup.exe,** and click **Open**.

   or

   a) Browse to the root directory of the location where you saved the contents of your BARCO NIO Display System Installation CD-ROM.
   b) Click on the file, **Setup.exe,** and click **Open**.
5. In the *Open* address window, place your cursor at the end of the line of text that appears and add the following text after *Setup.exe*, a space and *-silent*. Click **OK**.

   Example (where D is the name of your CD/DVD drive):

   D:\Setup.exe -silent

   See figure 25 for an example of how the command line window should look when using the silent install from the BARCO NIO Display System Installation CD-ROM.

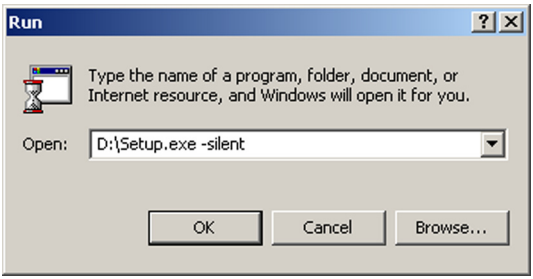


Figure 25: Command line installation

Note: When performing an MXRT driver upgrade, it is essential to uninstall the previous installation before installing the new driver. We also recommend that you perfrom the following steps to completely remove the previously installed files:

a) Boot the system in safe mode.

b) Run MXRT driver cleaner.bat by double clicking on it (this will either be installed as an icon on your desktop, or can be found on the Barco Display System installation CD at: *drivers\2KXP\ATI*). This will remove all the previous installed MXRT driver files.

c) Reboot the system in regular mode and install the new driver.

Installing the BarcoMed Coronis or Nio drivers and software

Note: The installation dialog will display in English if your operating system's language is not supported.

This process applies to the following versions of Windows:

- Windows 2000 Professional,
- Windows XP Professional,
- Windows XP Professional x64 Edition,
- Windows Server 2003,

- Windows Server 2003 x64 Edition, and
- Windows Vista 32 & 64 Bit Edition.

You will need to install the BARCO NIO Display system drivers and software in the following cases:

- After you have installed the display controller(s) for your BARCO NIO Display System in your system for the first time.
- After you have reinstalled or upgraded your operating system.
- After you have moved the display controller(s) to a different PCI/PCIe slot.

1. Start your system. When the *Found New Hardware Wizard* comes up, click **Cancel**. When the *System Settings Change* window asks you to restart your computer, click **No or Restart Later**.
2. Run the Barco Product Installation Wizard.

   The Barco Product Installation Wizard should start automatically if you insert the BARCO NIO Display System Installation CD-ROM into your CD/DVD drive *after* the operating system has started. If your CD/DVD drive's auto-run is not enabled or the Barco Product Installation Wizard does not start automatically, you can run the Barco Product Installation Wizard manually by following these steps:

   a) Click the **Start** button in the task bar.
   b) Click **Run**.
   c) Click **Browse** and browse to the root directory of the BARCO NIO Display System Installation CD-ROM and click on the file, **Setup.exe,** and click **Open**.
   d) Click **OK**.

   or

   a) Browse to the root directory of the BARCO NIO Display System Installation CD-ROM and double click on the file, **Setup.exe**.
3. Click **Next** twice.

4. Follow the wizard's on-screen instructions to complete the installation.

Note: When the page shown in figure 26 appears you may either click **Next** to accept the default settings or if you know the settings required for your viewing application, you may select them now and then click **Next**. You may change these settings later by accessing the Barco Driver tab within the *Windows Display Control Panel*.

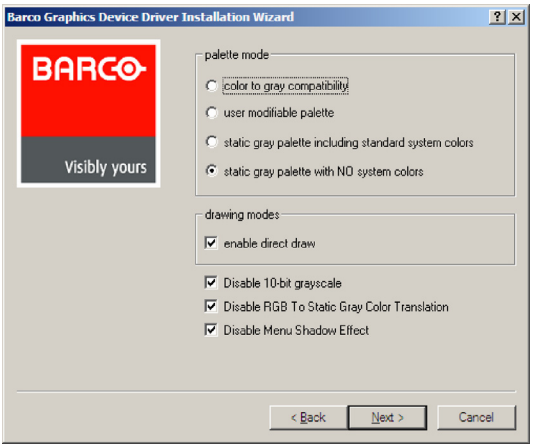


Figure 26:

Please refer to your application manuals for information on the correct Palette and Drawing modes to select.

5. When the driver setup is complete, click the **Finish** button.
6. The Barco Product Installation Wizard will now guide you through the installation of MediCal QAWeb, BarcoMed SelfExam, and the Barco on-line documentation.
7. When the Setup complete message appears, select **Reboot System Now** and click **Finish**.
8. After the system reboots, Windows may display either the *Digital Signature Not Found* message or *The software you are*

installing for this hardware has not passed Windows logo testing.

Automated display configuration

Once the drivers, software and documentation have been installed and your system has been rebooted, the *Barco Monitor Plug and Play Software* should automatically detect your Barco displays and attach them to the desktop with the correct resolution. If the *Barco Monitor Plug and Play Software* fails to detect your Barco displays or fails to attach them to the desktop correctly please refer to the section, **Setting the resolution of your Barco Coronis Display** in the **Configuring Windows** section of this manual.

Reinstalling drivers

You can install new drivers or reinstall existing drivers at any time by using the Barco Set-up wizard on your BARCO NIO Display System Installation CD-ROM, see **Installing the BARCOMED CORONIS or Nio drivers and software**, on page 60 of this manual.

Uninstalling the drivers and software

To uninstall the Barco drivers, software or documentation for your Nio display Systems, please use the *Windows Add/Remove Programs* or *Uninstall* utility. This can be found in the Windows Control Panel. For Vista use *Programs & Features*

Note: If you installed your BARCOMED CORONIS or Nio drivers with DualView enabled, the wizard will warn you that DualView must be disabled before the drivers can be uninstalled. This is normal, please follow the prompts from the wizard.

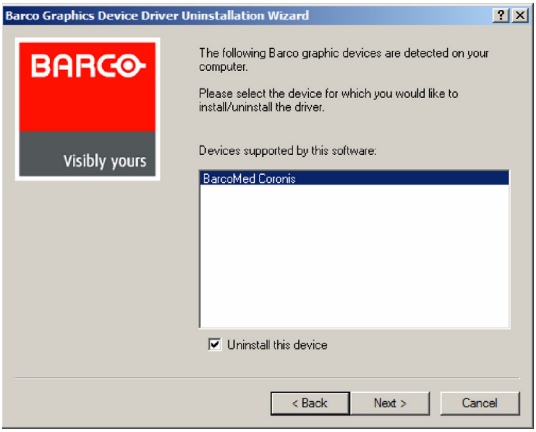

Barco Graphics Device Driver Uninstallation Wizard
BARCO
Visibly yours
The following Barco graphic devices are detected on your computer.
Please select the device for which you would like to install/uninstall the driver.
Devices supported by this software:
BarcoMed Coronis
Uninstall this device
< Back
Next >
Cancel

Figure 27: Barco Driver Removal Wizard

Command line (Silent) Install of Drivers and Software

(Not supported with Windows Vista)

Specifying the silent install option causes most of the GUI associated with the installer to disappear. A background progress window will still be visible, but no user input will be required.

The silent install behavior is dictated by the *SETUP.INI* file. Each application is allowed to have separate command-line parameters for normal and silent installs.

To install the drivers and software silently, please follow the steps below:

1. Insert the BARCO NIO Display System Installation CD-ROM into your CD/DVD drive. When the Barco Product Installation Wizard starts click **"Cancel"**.
2. Click the **Start** button in the task bar.
3. Click **Run**.
4. Click **Browse** and

a) Browse to the root directory of the BARCO NIO Display System Installation CD-ROM.

b) Click on the file, **Setup.exe,** and click **Open**.

or

a) Browse to the root directory of the location where you saved the contents of your BARCO NIO Display System Installation CD-ROM.

b) Click on the file, **Setup.exe,** and click **Open**.

5. In the *Open* address window, place your cursor at the end of the line of text that appears and add the following text after *Setup.exe*, a space and *-silent*. Click **OK**.

   Example (where D is the name of your CD/DVD drive):

   D:\Setup.exe -silent

   See figure 28 for an example of how the command line window should look when using the silent install from the BARCO NIO Display System Installation CD-ROM.

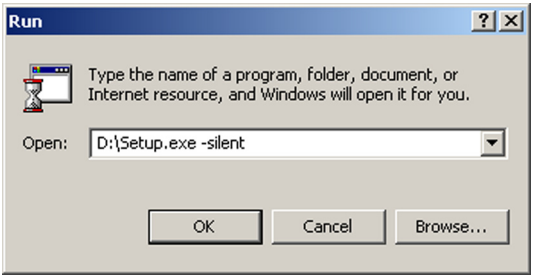


Figure 28: Command line installation

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Where to get more information

Where to find more information

The following documentation is included with your system:

Document	Location	Information
Quick install sheet	System box	Brief overview of the complete system set-up
Online user guide	Installed on the PC	Detailed description of the graphic board control panels and display controls and functions
Getting started guide (PDF)	System CD-ROM	This booklet in PDF format
Online user guide (PDF)	System CD-ROM	Same information as the online user guide on the PC, but in printer-friendly PDF format
QAWeb Agent user guide (PDF)	System CD-ROM	Description of the functions of QAWeb Agent in printer-friendly PDF format

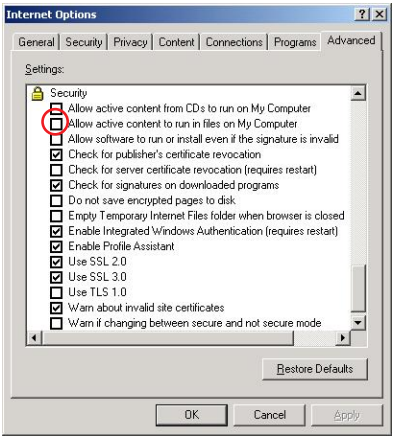
About the online user guide

The online user guide is installed on the system PC during the system driver installation. To open the online user guide, select Start>Program Files>Barco>Documentation>Nio online user guide from the Windows Start menu.

The online user guide uses Java scripts to create the html pages. In Windows XP, SP2, it is possible that Internet Explorer blocks them for security reasons. To display the pages, proceed as follows:

- In Windows control panel, select **Internet Options**
- Select the **Advanced** tab

- In the **Security** section, check the option **Allow active content to run in files on My Computer**



Troubleshooting

General tips

- If one display from a multi-head system exhibits problems, try to eliminate the problem by switching video cables or power supplies. In that way you can find out if the problem resides in the display or not.

If the display screen remains black after installation:

Possible causes:

- Power is not properly connected
- Video cable is not properly connected
- Video cable is bad
- Display is switched off - activate the power button to switch it on
- PC is started up while the display was not connected - reboot the PC while all displays are connected
- Graphic board resolution is too high or too low
- Two displays with different resolution are connected to the same graphic board
- One of the heads of the graphic board is not attached in the display properties control panel
- PC is in stand-by mode

Configuring Windows

Setting the resolution of your Barco Nio Display

Note: In order to set the resolution of your Barco Nio Display you must be logged in using an account with administrator privileges.

Accessing the Windows Display Control Panel

1. Open the "*Windows Display Control Panel*" by one of the methods below:
   a) Start > Settings > Control Panel > Display
   b) Open the *"Display Properties Control Panel"* by right clicking in an empty area on the desktop, then select **Properties**.
   c) **Windows Vista**: Right click in an empty area on the desktop, select "Personalization", then click on "Display Setting".
2. Click on the **Settings** tab (the **Settings** tab is not present in Vista).
3. Select the **rectangle** that represents the Barco display whose settings you wish to change.

Note: If you are using the VGA capabilities of your BarcoMed display controller, the resolution for the first display may be set to a VGA resolution of *"640 x 480"* pixels with 16 colors and a default refresh rate. If your BarcoMed controller is not running VGA, the display may not be enabled yet. To enable the display, check the *"Extend my Windows desktop onto this monitor"* **checkbox**, but do **NOT** click the **Apply** button at this time.

If you installed your Barco Nio Display System drivers in *SingleView* mode (default for Windows 2000) there will be one rectangle for the virtual display representing the two heads controlled by each BarcoMed display controller output.

If you installed your BARCO NIO Display System drivers in *DualView* mode (default for Windows XP) there will be a rectangle representing each head controlled by each output of the display controller. This will be true even if you have only one display connected to your BarcoMed controller. Both displays of a display controller cannot be enabled at the same time unless their display properties match. If necessary detach the second display of the BarcoMed display controller you are working with by right clicking on the **rectangle** that represents it, deselect **Attached** and click the **Apply** button.

Note: Since Windows will not let you detach the primary display connected to a particular controller, you may need to temporarily make another display the primary display

4. For the display which is still attached click Click on the **Advanced** Button.

5. Select the **Adapter** tab and then click on the **List All Modes** button. Select the resolution and refresh rate that your BARCO NIO Display display supports from the dialog box and click **OK**.

Note: In the Adapter box, the Adapter string shows if this display is the First View or the Second View attached to the display controller. Please make a note of this, so that you can arrange the displays in the correct order later if necessary.

6. Click **OK** on the bottom of the *Adapter Control Panel*. If the *"OK"* button on the bottom of the *Adapter Control Panel* is not visible, press the **TAB** key once and then press **CTRL+Enter** to select **OK**.

7. Click **OK** in the "Windows will now apply your new desktop settings" dialog box. Your BARCO NIO Display display should now synchronize and display the Windows desktop.

8. Click **Yes** when asked, "Your desktop has been reconfigured. Do you want to keep these settings?"

   To set the resolution of the second display attached to the BarcoMed display controller you are working with, go back to the "Settings" tab of the "Display Properties Control Panel". If necessary attach the second display you detached in step 2

above, by right clicking on the rectangle that represents it and selecting **Attached**.

Now repeat steps 5-8 above for this display.

If you are using a Quad-Head Configuration repeat all of the above steps for the two displays on the second display controller.

Note: If you have a single display configuration and you have enabled DualView, Windows will not allow you to attach the second head. This is normal and not a bug.

After enabling DualView and setting the resolutions in a Quad-Head Configuration you may need to drag the heads into the proper position in the window on the *"Settings"* tab, so that the arrangement in the window on the *"Settings"* tab matches the physical arrangement of your configuration.

Setting the Color and Palette Modes

(See ***Barco Controller Control Panel Settings*** section in this manual)

Configuring the Windows desktop

Note: In order to configure the Windows Desktop of your BARCO NIO Display System you must be logged in using an account with administrator privileges.

If you are using a color display in conjunction with your Barco grayscale display(s) you should configure your desktop before setting the resolution of the your Barco grayscale display(s).

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Technical specifications

MDNG-2121:

Item	Specification
Picture panel	21.3-inch diagonal viewable screen IPS grayscale liquid crystal display
Resolution	Native: 1600 x 1200
Display area (H x V)	432.0 x 324.0 (mm)
Viewing angle (@ 10/1 contrast)	Vertical: 88º Horizontal: 88º
Pixel Pitch	0.27 mm (H) x 0.27 mm (V)
Native color resolution	8 bits / sub-pixel
Luminance	500 cd/m² (calibrated, native white)
Contrast ratio	850/1 (typical, on axis in dark room)
Response time	13 ms typical (rise time 10% to 90%, @ 25° C after 30 min warm-up)
Controls	Push / turn control wheel for stand-by switching and OSD controls
Input connectors	DVI dual channel
Signal systems	Video on DVI: Complying to DVI Rev 1.0 specifications Sync on DVI: Complying to DVI Rev 1.0 specifications
USB standard supported	USB 2.0
Power source	Input for 12 VDC power supply unit: 90 ~ 264 VAC Input for display: 12 VDC. (The supplied 12VDC power supply must be used)
Power consumption	57 watts (nominal, at 90 VAC, calibrated, no USB load)

Item	Specification
Dimensions (W x H x D)	In perpendicular vertical position, highest position, tilt = 0°, swivel = 0°: 385 x 585 x 250 mm
Tilt angle	-5°/+25°
Swivel angle	45° left/right
Net weight	12.2 kg
Operating Temperature	Operation: 0°C to 40°C Within specs: 15°C to 35°C
Storage Temperature	-20°C to 60°C
Humidity	8% - 80% (non-condensing) for operation 5% - 95% (non-condensing) for storage
Altitude	7500 m storage 2000 m operation

E-3620 (MA):

Item	Specification
Picture panel	20.8-inch TFT AM-LCD IPS dual domain
Resolution	Native: 2048 x 1536
Display area (H x V)	423.9 x 318 (mm)
Viewing angle (@ 10/1 contrast)	Vertical: 170º Horizontal: 170º
Pixel Pitch	0.207 mm (H) x 0.207 mm (V)
Native color resolution	8 bits / sub-pixel
Luminance	500 cd/m² (calibrated)
Contrast ratio	900/1 (on/off in dark environment)
Response time	25 ms typical (@ 25° C after 30 min warm-up)
Controls	Push / turn control wheel for stand-by switching and OSD controls
Input connectors	DVI dual channel
Signal systems	Video on DVI: Complying to DVI Rev 1.0 specifications Sync on DVI: Complying to DVI Rev 1.0 specifications
USB standard supported	USB 1.1
Power source	Input for 12 VDC power supply unit: 90 ~ 264 VAC Input for display: 12 VDC. (The supplied 12VDC power supply must be used)
Power consumption	57 watts (nominal, at 90 VAC, calibrated, no USB load)

Item	Specification
Dimensions (W x H x D)	In perpendicular vertical position, highest position, tilt = 0°, swivel = 0°: 385 x 585 x 250 mm
Tilt angle	-5°/+30°
Swivel angle	45° left/right
Net weight	13 kg
Operating Temperature	0°C to 40°C, 15°C to 35°C within specs
Storage Temperature	-20°C to 60°C
Humidity	8% - 80% (non-condensing) for operation 5% - 95% (non-condensing) for storage
Altitude	7500 m storage 2000 m operation

MDNG-5121 (MA):

Item	Specification
Picture panel	21.3" Dual domain IPS, normally black
Resolution	Native: 2560 x 2048
Display area (H x V)	422.4 x 337.92 mm
Viewing angle (@ 10/1 contrast)	Vertical: 170º Horizontal: 170º
Pixel Pitch	0.165 mm (H) x 0.165 mm (V)
Native color resolution	8 bits / sub-pixel
Luminance	500 cd/m² (calibrated)
Contrast ratio	800/1 (on/off in dark environment)
Response time	25 ms typical (@ 25° C after 30 min warm-up)
Controls	Push / turn control wheel for stand-by switching and OSD controls
Input connectors	DVI dual channel
Signal systems	Video on DVI: Complying to DVI Rev 1.0 specifications Sync on DVI: Complying to DVI Rev 1.0 specifications
USB standard supported	USB 1.1
Power source	Input for 12 VDC power supply unit: 100 ~ 250 VAC Input for display: 12 VDC. (The supplied 12VDC power supply must be used)
Power consumption	65 watts (nominal, at 90 VAC, calibrated, no USB load)

Item	Specification
Dimensions (W x H x D)	In perpendicular vertical position, highest position, tilt = 0°, swivel = 0°: 408 x 591 x 250 mm
Tilt angle	-5°/+30°
Swivel angle	45° left/right
Net weight	11.1 kg
Operating Temperature	0°C to 40°C, 15°C to 35°C within specs
Storage Temperature	-20°C to 60°C
Humidity	8% - 80% (non-condensing) for operation 5% - 95% (non-condensing) for storage
Altitude	7500 m storage 2000 m operation

MDNC 3120 (MA):

Item	Specification
Picture panel	20.8" TFT AM LCD, Dual domain IPS, color
Resolution	Native: 2048 x 1536
Display area (H x V)	423.9 x 318.0
Viewing angle (@ 10/1 contrast)	Vertical: 170º Horizontal: 170º
Pixel Pitch	0.207 mm (H) x 0.207 mm (V)
Native color resolution	8 bits / sub-pixel
Luminance	230 cd/m² (calibrated)
Contrast ratio	400/1 (on/off in dark environment)
Response time	25 ms typical (@ 25° C after 30 min warm-up)
Controls	Push / turn control wheel for stand-by switching and OSD controls
Input connectors	DVI dual channel
Signal systems	Video on DVI: Complying to DVI Rev 1.0 specifications Sync on DVI: Complying to DVI Rev 1.0 specifications
USB standard supported	USB 1.1
Power source	Input for 12 VDC power supply unit: 100 ~ 250 VAC Input for display: 12 VDC. (The supplied 12VDC power supply must be used)
Power consumption	65 watts (nominal, at 100 VAC, calibrated, no USB load)

Item	Specification
Dimensions (W x H x D)	In perpendicular vertical position, highest position, tilt = 0°, swivel = 0°: 385 x 585 x 250 mm
Tilt angle	-5°/+30°
Swivel angle	45° left/right
Net weight	13 kg
Operating Temperature	0°C to 40°C, 15°C to 35°C within specs
Storage Temperature	-20°C to 60°C
Humidity	8% - 80% (non-condensing) for operation 5% - 95% (non-condensing) for storage
Altitude	7500 m storage 2000 m operation

MDNC-3121:

Item	Specification
Picture panel	21.3" LCD, IPS, color
Resolution	Native: 2048 x 1536
Display area (H x V)	433.152 x 324.864
Viewing angle (@ 10/1 contrast)	Vertical: 88º Horizontal: 88º
Pixel Pitch	0.2115 mm (H) x 0.2115 mm (V)
Native color resolution	8 bits / sub-pixel
Luminance	400 cd/m² (calibrated native white)
Contrast ratio	750/1 (on axis in dark environment)
Response time	14 ms rise, 10 ms fall (@ 25° C after 30 min warm-up)
Controls	Push / turn control wheel for stand-by switching and OSD controls
Input connectors	DVI dual channel
Signal systems	Video on DVI: Complying to DVI Rev 1.0 specifications Sync on DVI: Complying to DVI Rev 1.0 specifications
USB standard supported	USB 2.0
Power source	Input for 24 VDC power supply unit: 90 ~ 264 VAC Input for display: 24 VDC. (The supplied 24VDC power supply must be used)
Power consumption	72 watts (nominal, at 100 VAC, calibrated, no USB load)

Item	Specification
Dimensions (W x H x D)	In perpendicular vertical position, highest position, tilt = 0°, swivel = 0°: 385 x 585 x 250 mm
Tilt angle	-5°/+30°
Swivel angle	45° left/right
Net weight	13 kg
Operating Temperature	0°C to 40°C, 15°C to 35°C within specs
Storage Temperature	-20°C to 60°C
Humidity	8% - 80% (non-condensing) for operation 5% - 95% (non-condensing) for storage
Altitude	7500 m storage 2000 m operation

E-2621 (MA):

Item	Specification
Picture panel	21.3-inch diagonal viewable screen TFT (thin film transistor) active matrix, gray-scale liquid crystal display
Resolution	Native: 1600 x 1200
Display area (H x V)	432.0 x 324.0 (mm)
Viewing angle (@ 10/1 contrast)	Vertical: 160º Horizontal: 160º
Pixel Pitch	0.27 mm (H) x 0.27 mm (V)
Native color resolution	8 bits / sub-pixel
Luminance	500 cd/m² (calibrated)
Contrast ratio	700/1 (on/off in dark environment)
Response time	17.5 ms typical (@ 25° C after 30 min warm-up)
Controls	Push / turn control wheel for stand-by switching and OSD controls
Input connectors	DVI dual channel
Signal systems	Video on DVI: Complying to DVI Rev 1.0 specifications Sync on DVI: Complying to DVI Rev 1.0 specifications
USB standard supported	USB 1.1
Power source	Input for 12 VDC power supply unit: 90 ~ 264 VAC Input for display: 12 VDC. (The supplied 12VDC power supply must be used)
Power consumption	57 watts (nominal, at 90 VAC, calibrated, no USB load)

Item	Specification
Dimensions (W x H x D)	In perpendicular vertical position, highest position, tilt = 0°, swivel = 0°: 385 x 585 x 250 mm
Tilt angle	-5°/+30°
Swivel angle	45° left/right
Net weight	14 kg
Operating Temperature	Operation: 0°C to 40°C Within specs: 15°C to 35°C
Storage Temperature	-20°C to 60°C
Humidity	8% - 80% (non-condensing) for operation 5% - 95% (non-condensing) for storage
Altitude	7500 m storage 2000 m operation

MDNG-6121:

Item	Specification
Picture panel	21.3-inch diagonal viewable screen IPS grayscale liquid crystal display
Resolution	Native: 2800 x 2096
Display area (H x V)	432.6 x 324.5 (mm)
Viewing angle (@ 10/1 contrast)	Vertical: 85º Horizontal: 85º
Pixel Pitch	0.154 mm (H) x 0.154 mm (V)
Native color resolution	10 bits / sub-pixel
Luminance	500 cd/m² (calibrated, native white)
Contrast ratio	1000/1 (typical, on axis in dark room)
Response time	17 ms typical (rise time 10% to 90%, @ 25° C after 30 min warm-up)
Controls	Push / turn control wheel for stand-by switching and OSD controls
Input connectors	DVI dual channel
Signal systems	Video on DVI: Complying to DVI Rev 1.0 specifications Sync on DVI: Complying to DVI Rev 1.0 specifications
USB standard supported	USB 2.0
Power source	Input for 12 VDC power supply unit: 90 ~ 264 VAC Input for display: 12 VDC. (The supplied 12VDC power supply must be used)
Power consumption	68 watts (nominal, at 90 VAC, calibrated, no USB load)

Item	Specification
Dimensions (W x H x D)	In perpendicular vertical position, highest position, tilt = 0°, swivel = 0°: 385 x 585 x 250 mm
Tilt angle	-5°/+25°
Swivel angle	45° left/right
Net weight	12.3 kg
Operating Temperature	Operation: 0°C to 40°C Within specs: 15°C to 35°C
Storage Temperature	-20°C to 60°C
Humidity	8% - 80% (non-condensing) for operation 5% - 95% (non-condensing) for storage
Altitude	7500 m storage 2000 m operation

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Warranty Statement

BARCO MID GENERAL WARRANTY TERMS AND CONDITIONS

Applicable from Jan 1st 2008

ARTICLE 1: PRODUCT WARRANTY

Barco nv, Medical Imaging Division warrants that the equipment will be free of defects in workmanship or material for the warranty period or the specific period of a warranty extension program.

Hardware: Barco warrants that upon delivery hereunder the Products shall (i) conform to its specifications in effect at the date of delivery and (ii) be free from defects in material and workmanship (the "Warranties").

Software: Barco warrants that software written by Barco shall perform substantially in accordance with the specifications in effect at the date of delivery. Software is inherently susceptible to bugs and errors. Barco makes no warranties with respect to the software which is provided to Customer on an "as-is" basis and does not warrant uninterrupted or error-free operation of the Products.

Unless otherwise indicated in Barco's Product manual or in the agreement between Barco and Customer, the Warranty Period shall be

(a) Hardware: 12 months commencing on the Barco date of invoice.

(b) Software: 3 months commencing on the Barco date of invoice.

Notwithstanding the provisions of clause 2, repair and replacement of defects in material and/or workmanship under this warranty shall be accomplished in our works according to the terms and conditions as set forth hereafter:

1.1

Any claim under the Warranties must be notified to Barco in writing within 8 days from the date the defect or failure has been discovered or noticed the first time. The Customer, upon the occurrence of any equipment failure, shall contact Barco nv, MID customer support centre (or an authorised service centre) by telephone, fax or e-mail and shall provide the applicable customer support person with a complete description of the problem being encountered, including the model and serial number of the equipment in which the problem has arisen.

1.2

The customer support person shall diagnose the problem experienced by the Customer and shall advise the Customer on how to proceed. Customer support may ask to return the faulty equipment or faulty subassemblies to the Barco nv, or a MID customer support centre (or an authorised service centre) for repair activities. In no event shall Customer return a defective Product or part thereof to Barco without Barco's prior written approval.

In the event the return to Barco of the defective Product is authorized by Barco, Barco shall issue to Customer an RMA (Return Material Authorization).

The Customer shall apply for an RMA number to the closest Barco nv, MID Customer support centre (or an authorised service centre) as listed at www.barcomedical.com, unless otherwise indicated.

The one-way cost of packing, transport and insurance related to shipping the alleged defective Product or part to Barco for repair or replacement shall be borne by Customer. The one-way cost of packing, transport and insurance related to shipping of the repaired or replacement Product or part to Customer shall be borne by Barco.

1.3

The Customer shall return, freight prepaid, the defective equipment or subassemblies in its original packaging with the assigned RMA number for repair to the Barco nv, MID Customer support centre (or an authorised service centre).

1.4

Replacement parts used shall be new or equivalent to new parts for the revision level of the equipment. A replacement LCD panel will be new or similar run time. The warranty period for the replacement parts will expire at the same moment as the original warranty period of the equipment. All parts replaced hereunder and returned to Barco nv, MID (or an authorised service centre) shall become the property of Barco nv, MID (or the authorised service centre).

1.5

The repaired equipment shall be returned to the Customer, by regular freight, at Barco nv, MID's charge.

1.6

Barco nv, MID will replace a product that fails within 90 days after shipment from Barco with a new one, ensuring color matching in the event of a diagnostic multi head display configuration.

Barco aims to ship the new replacement product within 2 business days after receipt of the Customers notification in writing.

ARTICLE 2: CONDITIONS PRECEDENT FOR WARRANTY AND ITEMS EXCLUDED FROM WARRANTY

A. The Warranties shall apply only to the extent the Products or any parts thereof have

(i) been transported and stored at all times in the original packaging in the conditions as specified by Barco (such as covered and secure location, minimum and maximum temperature, maximum humidity, ...) or, in absence thereof, at least in conditions consistent with generally accepted practice for this type of products;

(ii) been handled at all times in accordance with Barco's instructions or, in absence thereof, at least with the care and caution consistent with generally accepted practice for this type of products;

(iii) been installed strictly in accordance with the instructions and directions given by Barco (if and to the extent the Products have not been installed by Barco or its authorized subcontractors);

(iv) not been subject to any unauthorized access, alteration, modification or repair or attempts thereto;

(v) been at all times "normally used" for the intended purpose and operated in strict accordance with the operating instructions set forth in the operating manual of the Product in question and shall not have been otherwise misused, abused, damaged. For the purpose hereof, "normally used" shall mean a regular, ordinary and routine usage of the Product in question as intended and/or recommended by Barco;

(vi) been maintained at all times in accordance with Barco's instructions or, in absence thereof, at least with intervals and in a manner consistent with generally accepted practice for this type of products;

B. The warranty described herein shall not include the following:

2.1

Any hardware or software item procured from a source other than Barco nv, MID or their official agent or distributor and integrated by Customer or a third party into Barco nv, MID supplied equipment.

2.2

Any host configuration not explicitly supported by Barco nv, MID.

2.3

All software installed on the system, whether they are acquired from Barco nv, MID or third party. An exception is made for software delivered by Barco nv, MID that would prove to be a cause for the mal functioning of the hardware covered under this Agreement.

2.4

Normal wear and tear, use under circumstances exceeding specifications, such as use in dusty environment or under excessive temperature conditions, abuse, unauthorised repair or alternation, lack of proper configuration or maintenance, damaged or modified or removed serial number, cosmetic refurbishment.

2.5

Repair or replacement of consumables[1] or specific parts that by definition are subject to wear and tear, including but not limited to:

a.CRT's, LCD panels

b.Backlights in diagnostic LCD displays, when the backlight run time[2] is beyond the Guaranteed Backlight Lifetime[3] of that model, when used at the Factory Calibrated Luminance[4]

Eg1.

- A display is used at 8 hours/day; ie. +/-2.920hours/year
- The display system is covered with a warranty period of 5 year
- The Guaranteed Backlight Lifetime of that model is 17.000hours.
- The Factory Calibrated Luminance cannot be achieved anymore after 4 year, thus corresponding to +/-11.680hours
- Result: the backlight replacement is performed under warranty

Eg2.

- A display is used at 24 hours/day; ie. 8.760hours/year
- The display system is covered with a warranty program of 5 year
- The Guaranteed Backlight Lifetime of that model is 17.000hours.
- The Factory Calibrated Luminance cannot be achieved anymore after 2.5years, thus corresponding to +/-21.900hours
- Result: the backlight replacement does not make part of the warranty coverage.

(1): 'Consumable' is a part that can be replaced by the user

(2): 'Backlight run time' is the total time that an image (including use of a screen saver) has been applied to the screen; this value can be consulted via the OSD buttons (On Screen Display).

(3): 'Guaranteed Backlight Lifetime' is the number of backlight hours during which a predefined luminance value, ie. the Factory Calibrated Luminance, will be provided by a specific diagnostic display model. This figure is printed on the Warranty certificate of each display or can be requested at your local Barco office.

(4): 'Factory Calibrated Luminance': is the typical luminance value that a specific diagnostic display model is calibrated at during the production process. This figure is printed on the Warranty certificate of each display or can be requested at your local Barco office.

c. Lamps, optical components in projectors

d. Replacement because of:

i. image retention as a result of:

- not correctly using screen saver and/or Display Power Management System (DPMS) as explained in the user manual
- prolonged operation of the display with a static image on the same screen area

ii. a number of missing pixels that is lower than the total allowable number as mentioned in the product specifications.

iii. difference in color temperature that is lower than the total allowable difference as mentioned in the product specifications

iv. difference in color temperature as a result of not using all displays of a multi-head configuration at the same rate.

v. LCD luminance uniformity that is in within the product specifications or luminance uniformity performance that is inherent to LCD technology.

Barco nv, MID does not warrant a minimum life time nor a performance of any of the consumables.

2.6

Replacement of moveable parts such as power cords, remote controls, ...

2.7

Any product disassembly and installation costs at the operation site, travel expenses and travel time to and from the operation site for the personnel in charge of the repair works and transport charges.

2.8

Any failures resulting from an accident, negligence (such as but not limited to removing or deleting system files & licensed software product files), misuse, circuit failure or any change, damage due to fire, water, thunder or lightning, power failure or fluctuation, disruption of communication lines or due to force majeure, or any reason foreign to the equipment.

2.9

Any specific services or procedures, asked for by Customer, related to verification of repaired equipment.

2.10 The evaluation cost in case of a returned product deemed functional is not covered under warranty and will be charged to the Customer, at Barco's sole discretion, based on a case-by-case evaluation.

ARTICLE 3: OBLIGATIONS OF THE CUSTOMER

Customer hereby assumes the following obligations as partial consideration for Barco nv, MID performance of its requirements under the warranty condition; failure by Customer to meet its obligations under this paragraph shall excuse Barco nv, MID's performance hereunder:

3.1

Customer shall not expose Barco nv, MID personnel to any unsafe working conditions.

3.2

Repairs to equipment under warranty resulting from improper maintenance or repair performed by the Customer, or its officers, agents, employees, or representatives, shall be borne by the Customer at its additional cost and expense.

3.3

The Customer is responsible for installing the Barco nv, MID equipment in an environment for which it was intended. If there is an indication that the equipment was used – even temporary – outside its specifications, Barco nv, MID is entitled not to perform warranty repairs and terminate the warranty agreement. Any actions that have been taken by Barco nv, MID in this respect, may be invoiced to the Customer at normal pricing.

ARTICLE 4: REMEDIES UNDER WARRANTY

(a) Hardware: If during the Warranty Period a Product or any part thereof, fails to meet any of the Warranties then, upon Customer's request, Barco shall, at its sole option and cost, promptly and within 20 working days, either: (i) repair or correct the Product or part in question; or (ii) replace the Product or supply part(s) or component(s) according to the terms and conditions contained in article 1. A replacement part shall be at least functionally equivalent to the original part. The replaced Product, parts and/or components shall become the property of Barco and shall, at Barco's request, be returned by Customer to Barco at Barco's cost.

(b) Software: Barco's sole obligation shall be to rectify substantial malfunctions of the software (to the extent technically reasonably possible) by amending the software or supplying an alternative version of the software.

(c) The repair or replacement under the Warranties covers the cost of material and labor.

ARTICLE 5: DISCLAIMER OF WARRANTIES

BARCO NV, MID DISCLAIMS ALL WARRANTIES, EXPRESSED OR IMPLIED, INCLUDING ALL IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE.

ARTICLE 6: LIMITATION OF LIABILITY

The remedies specified in these Terms and Conditions shall constitute Customer's sole and exclusive

remedy and Barco's sole and exclusive liability for Barco's breach of the Warranties hereunder.

BARCO NV, MID SHALL NOT UNDER ANY CIRCUMSTANCES BE LIABLE TO CUSTOMER OR ANY THIRD PARTY FOR DIRECT, INDIRECT, INCIDENTAL, SPECIAL OR CONSEQUENTIAL DAMAGES, SUCH AS BUT NOT LIMITED TO, DAMAGE TO OR LOSS OF TANGIBLE OR INTANGIBLE PROPERTY OR EQUIPMENT, LOSS OF PROFITS OR REVENUES, COST OF CAPITAL, COST OF PURCHASE OF REPLACEMENT GOODS, OR CLAIMS OF USER FOR SERVICE INTERRUPTIONS. THE LIABILITY OF BARCO NV, MID FOR MANUFACTURING, SALE, DELIVERY, RESALE, INSTALLATION, OPERATION OR SUITABILITY FOR USE OF ANY PRODUCTS OR SERVICES COVERED BY OR FURNISHED UNDER THIS WARRANTY CONDITION, WHETHER ARISING OUT OF CONTRACT, NEGLIGENCE, STRICT TORT, WARRANTY OR OTHERWISE, SHALL NOT EXCEED THE PRICE OF THE ITEM OR ITEMS OF GOODS OR SERVICES UPON WHICH SUCH LIABILITY IS BASED.

ARTICLE 7: FORCE MAJEURE

Either party shall be released from performance of its obligations under this agreement to the extent, and for so long as, the performance of this agreement is impeded by reason of force majeure. For the purposes of this clause the expression "force majeure" means, but shall not be limited to, industrial dispute, fire, mobilisation, requisition, embargo, currency transfer prohibitions, insurrection, lack of means of transport, restrictions of the use of energy, and generally any circumstances which are beyond the control of the parties and hinder performance by one party of his obligations.

ARTICLE 8: GENERAL

8.1

Customer acknowledges its understanding that all software and electronic devices, including Barco nv, MID products are subject to possible error, mechanical or electrical failure, and should not be relied upon in inappropriate applications or without proper backup and/or other safety precautions whenever personal injury or property damage may result from failure or error of the product.

8.2

Barco nv, MID shall not be responsible for machine failure and/or its failure to render service or maintenance due to causes beyond its reasonable control.

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